UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

MAR 10 2010

Mr. David Keith
Project Coordinator
Anchor QEA
2113 Government Street
Building D, Suite 3
Ocean Springs, MS 39654

RE: Comments on Draft Sampling and Analysis Plan: Sediment Study
San Jacinto River Waste Pits Superfund Site

Dear Mr. Keith:

The U.S. Environmental Protection Agency (EPA) has completed its review of the *Draft Sampling and Analysis Plan: Sediment Study* (dated February 2010) for the San Jacinto River Waste Pits Superfund Site.

Enclosed with this letter are review comments originating from the EPA, Texas Commission on Environmental Quality, and Federal and State Trustees. All review comments are considered to be as representative of EPA for purposes of the Unilateral Administrative Order for Remedial Investigation/Feasibility Study for this site.

Please address each review comment in the final deliverable and feel free to contact me at (214) 665-8409, or by email at tzhone.stephen@epa.gov, if there are any questions or comments.

Sincerely,

Stephen L. Tzhone, RPM

Enclosures (3)

cc: Ms. Ludmila Voskov, TCEQ
Ms. Jessica White, NOAA

633909

USEPA COMMENTS
Draft Sampling and Analysis Plan: Sediment Study (February 2010)
San Jacinto River Waste Pits Superfund Site

Comment #1: General Comment, Whole Document:
Everywhere in the body of the sediment sampling & analysis plan that "CDF" is mentioned; add the word "potential" beforehand (with grammatical adjustments, as necessary). This is necessary because a CDF remedial alternative has not been selected at this stage and the geotechnical sampling data is for an evaluation of CDF feasibility, along with other containment systems.

Comment #2: General Comment, Whole Document:
Everywhere that "Big Star" or "Big Star property" is mentioned, replace with: "property west of the impoundments" (with grammatical adjustments, as necessary). This is necessary due to ongoing enforcement and privacy considerations.

Comment #3: General Comment, Other:
Required dioxin consultation with the EPA Office of Superfund Remediation and Technology Innovation (OSRTI) indicated that the sample grid (500 ft) is too large for soil sampling. An alternate grid size should be discussed for soils when planning for soil sampling.

Comment #4: Figure 5, Study Area Overview:
Figure 5 and text in Section 1.4.1.2 are inconsistent (i.e., Figure 5 should include southern boundary of Study Area as stated, which is Upper Galveston Bay).

Comment #5: Figure 14, Proposed Geotechnical Borings and Vane Shear Test Locations:
Additional borings are needed to fully delineate the surface area and depth of the waste pits, including risk characterization and engineering construction evaluation. EPA recommends the addition of at least eight geotechnical borings within the source impoundments (not on the perimeter berm, separator berm, or scour channels) with chemistry profiles for Primary and Secondary COPCs. A minimum of four additional borings shall be in the western impoundment and four in the eastern impoundment.

Comment #6: Figure 14, Proposed Geotechnical Borings and Vane Shear Test Locations:
Additional borings are needed to verify that the I-10 Highway (when expanded from Highway 73) was not built in the waste pits. EPA recommends the addition of at least four geotechnical borings underneath the northern edges of the I-10 Highway that is parallel to the current southern perimeter berm of the impoundments, with chemistry profiles for Primary and Secondary COPCs.

Comment #7: Figure 15, Nature and Extent Sediment Sampling:
SJNE026 and SJNE032 should be core samples as well. Possible contamination may have been moved to depth by dredging activities.

Comment #8: Figure 16, Upstream Sediment Sampling Locations:
The ecological samples SJRH050, SJRH051, and SJRH052 should not be located so near a railroad bridge. These samples should be taken at the same location as those proposed for the human health risk assessment (i.e., SJSH031 to SJSH040). This request assumes that area also represents suitable ecological habitat. If that area is not representative, then the team will need to determine an alternate reference area for ecological sampling and perhaps human health as well.

Comment #9: Figure 17, Human Health and Ecological Exposure Sediment:
Add at least ten HH surface and subsurface sediment samples to the shoreline area immediately west, southwest, south, southeast, and east of SJSH044 to SJSH046 to address potential recreational and trespasser/transient exposure.

Comment #10:Figure 17, Human Health and Ecological Exposure Sediment:
Add at least fifteen HH surface and subsurface sediment samples to the shoreline area (across water) northwest, north, northeast, east, southeast, and south of SJSH047 to SJSH049 to address potential recreational and trespasser/transient exposure.

Comment #11:Figure 17, Human Health and Ecological Exposure Sediment:
Add at least five HH surface and subsurface sediment samples between SJSH006 and the shoreline area (across water) north, northeast, east, southeast of SJSH041 to SHSH043 to address potential recreational and trespasser/transient exposure.

Comment #12:Figure 17, Human Health and Ecological Exposure Sediment:
Add five HH surface and subsurface sediment samples along the shoreline area immediately north, then west of SJSH005 to address potential recreational and trespasser/transient exposure.

Comment #13:Section 1.2, Introduction and Task Organization:
Replace second paragraph, "As agreed by USEPA…" with: "As agreed by USEPA on January 20, 2010, the RI/FS Work Plan and SLERA will be submitted on March 31, 2010. This SAP is being submitted prior to the RI/FS Work Plan so that information relevant to the RI can be collected as early as practical. This SAP addresses only the sampling and analysis of sediments required for the RI/FS. This document is the SAP, and consists of this Quality Assurance Project Plan (QAPP) and the Field Sampling Plan (FSP), which is included as Appendix A. The QAPP was prepared consistent with USEPA guidance and requirements for QAPPs (USEPA 1998, 2001), as required by the 2009 UAO. Additional SAPs setting forth the QAPPs and FSPs for sampling of other media (e.g., biological tissue, soils) will be submitted according to the schedule provided in the RI/FS Work Plan."

Comment #14:Section 1.4.1, Site History:
Replace second paragraph, "In 1965, the impoundments…" with: "In 1965, the impoundments were constructed by forming berms within the estuarine marsh, just north of what was then Texas State Highway 73, and is now I-10, to the west of the main river channel. The two primary impoundments at the Site were divided by a central berm running lengthwise (north to south) through the middle, and were connected with a drain line to allow flow of excess water (including rain water) from the impoundment located to the west of the central berm, into the impoundment located to the east of the central berm (Figure 2). The excess water collected in

the impoundment located to the east of the central berm was pumped back into barges and returned to the Champion paper plant.

Comment #15:Section 1.4.1, Site History:
Replace third paragraph, "In 1965 and 1966…" with: "In 1965 and 1966, pulp and paper mill wastes (both solid and liquid) were reportedly transported by barge from the Champion Paper Inc. paper mill in Pasadena, Texas, and unloaded at the Site into the impoundments where the waste was stabilized and stored. The excess water from the impoundments was pumped back into barges and returned to the Champion Paper Inc. paper mill, where it passed through the last settling ponds and discharged into the Channel with the rest of the paper mill effluent. The Champion Paper mill used chlorine as a bleaching agent, and the wastes that were deposited in the impoundments have recently been found to be contaminated with polychlorinated dibenzo-p-dioxins, polychlorinated furans (dioxins and furans), and some metals (TCEQ and USEPA 2006); additional discussion of the chemical constituents typical of materials like those deposited in the impoundments is provided in Section 1.5. The impoundments were used for waste disposal from September 1965 through May 1966 until both impoundments were filled to capacity. In a letter dated July 1966, the Texas Water Pollution Control Board stated that it was their understanding that no additional waste material would be placed in the impoundments."

Comment #16:Section 1.4.1, Site History:
Replace third paragraph, "Physical changes at the…" with: "Physical changes at the Site in the 1970s and 1980s, including regional subsidence of land in the area due to large scale groundwater extraction and sand mining within the river and marsh to the west of the impoundments, have resulted in partial submergence of the impoundments and exposure of the contents of the impoundments to surface waters. Based upon review of U.S. Corps of Engineers approved dredging permits, dredging by third parties have occurred in the vicinity of the impoundments. Recent samples of sediment in nearby waters north and west of the impoundments (University of Houston and Parsons 2006) indicate that dioxins and furans are present in nearby sediments at levels higher than levels in background areas nationally (USEPA 2000)."

Comment #17:Section 1.4.1, Site History:
Replace fourth paragraph, "Current land use and…" with: "Current land use and planned zoning and parcel boundaries are shown in Figure 3. Residential, commercial, industrial, and other land use activities occur within the Preliminary Site Perimeter and the Study Area. Residential development on the eastern bank of the river is present within 0.5 mile of the Site. The impoundments are currently occupied by late successional stage estuarine riparian vegetation to the west of the central berm, and are consistently submerged even at low tide to the east of the central berm. Estuarine riparian vegetation lines the upland area that runs parallel to I-10 and west of the impoundments. A sandy intertidal zone is present along the shoreline throughout much of the Site (Figure 2)."

Comment #18:Section 1.4.2.2, Existing Physical Data:
Replace first paragraph, "Existing physical data include…" with:
"Existing physical data include Site bathymetry and geotechnical studies that were performed for the Texas Department of Transportation (TXDOT), which were associated with the I-10 Bridge

crossing at the San Jacinto River (Weston 2006). In addition, a 2009 bathymetric survey was conducted west and north of the impoundments (Hydrographic Consultants 2009). Also, there is limited TXDOT bathymetric survey data (date unknown) associated with the dolphin project in the vicinity of the I-10 Bridge."

Comment #19:Section 1.4.3, Problem Definition and Overall CSM:
Replace first paragraph, "Two major physical changes…" with: "Major physical changes resulted in the exposure of the wastes deposited within the impoundments to surface waters and the distribution of contaminated materials into nearby surface sediments. Land subsidence resulting from groundwater withdrawal in the 1970s contributed to the sinking of the impoundments. As a result of this event, contaminated material was distributed and became potentially accessible to ecological receptors and to people at the Site. Material from the berm and from within the impoundment was subject to mobilization and redistribution by erosion resulting from tidal and river currents. Dredging activities in the area may have affected the Site. Mobilization of materials by dredging may have released sediment-associated contaminants to the water column that would have settled to the bottom. Determining the spatial extent of sediment contaminants from the impoundments is one issue that will be addressed in the RI/FS."

Comment #20:Section 1.4.3, Problem Definition and Overall CSM:
Replace last sentence of the fourth paragraph, "Finally, characterization of the…" with: "Finally, characterization of the physical properties of the sediment surrounding the impoundments is needed to evaluate remedial alternatives at the location of the impoundments."

Comment #21:Section 1.6.1, Background Concentrations Used in the Risk-Based Screens:
Generally background is not used during the initial screen of chemicals of potential concern (COPC). Background conditions should be noted in the screens but background COPCs should be taken though the risk assessment process and should be differentiated in the Risk Characterization. Note that EPA does not set cleanup levels below the background concentration.

Comment #22:Section 1.6.3, Benthic Macroinvertebrate Risk-Based Screen:
The Texas Commission of Environmental Quality (TCEQ) benchmarks were used as a secondary source of screening level values (SLVs). The TCEQ screening levels should be presented for all chemicals whether or not an Effective Range Low (ERL) is available. EPA and TCEQ will appreciate the transparency of having State values being presented as well as ERLs

Comment #23:Section 1.8, Uncertainties and Data Gaps:
Replace first paragraph, "Uncertainties and data gaps…" with: "Uncertainties and data gaps currently present in the dataset related to the Site are discussed below. The sediment study proposed in this document addresses the collection and analysis of new information to confirm existing data and to address and reduce the uncertainties in the existing data."

Comment #24:Section 1.8.1, Nature and Extent:
Replace first paragraph, "Surface sediment concentrations of…" with: "Surface sediment concentrations of COPCs have been measured throughout the defined Study Area (Figures 4 and 6). The spatial resolution of these samples is fairly low; the average spacing between the

samples collected in 2005 in a grid surrounding the impoundments for the TMDL program (University of Houston and Parsons 2006) is approximately 1,000 feet (305 m), and these data are only for dioxins and furans. The steepest spatial gradients of dioxin/furan concentrations are between samples collected from within the impoundment or on the shoreline of property west of the impoundments and samples that are approximately 1,000 feet (305 m) away (Figure 4). At distances greater than approximately 1,000 feet (305 m) from these two locations, the spatial gradient of concentrations appears to be much lower on the basis of the available data (Figure 13). Sediment conditions within 1,000 feet (305 m) of the impoundments and of the shoreline of property west of the impoundments are not well characterized."

Comment #25:Section 1.8.1, Nature and Extent:
Replace the first sentence of the second paragraph, "In addition, concentrations of…" with: "In addition, concentrations of dioxins and furans in sediment along the eastern and northeastern perimeter of the original impoundments are not well described by the existing dataset and need to be confirmed (Figure 4)."

Comment #26:Section 1.8.5: Engineering-Related Information:
Replace first paragraph, "Additional information is required…" with: "Additional information is required to address the physical properties of sediments surrounding the impoundments to support a full evaluation of remedial alternatives, including the potential construction of a CDF within the Site or complete removal of the contents of the impoundments to be deposed offsite."

Comment #27:Section 1.8.5.1: Geotechnical Data:
Replace first paragraph, "A key component of…" with: "A component of the FS is developing an understanding if reestablishment of waste pit containment is feasible, either through reconstruction of the berms or by other appropriate measures or if removal of the waste contained in the impoundments is a more appropriate remedial alternative. Additionally, dredging of sediments in the river may be a potential remedial action; and therefore, the dredgability and materials-handling characteristics of the river sediments should be understood. The information used to evaluate these issues is geotechnical engineering data."

Comment #28:Section 1.8.5.1: Geotechnical Data:
Replace the second sentence of the second paragraph, "As described below, supplemental…" with: "As described below, supplemental geotechnical data are required in order to support assessment of the dredgability of river sediments, and to evaluate berm design and potential construction techniques."

Comment #29:Section 1.8.5.3: Waste Impoundment Containment:
Replace first paragraph, "Geotechnical information is required…" with: "Geotechnical information is required to evaluate engineering considerations for the potential re-establishment of a containment system around the Site and to provide design information. Broadly, four categories of subsurface information are required for geotechnical engineering design: conventional geotechnical parameters, soil permeability, soil strength, and soil compressibility. Proposed containment berm side-slopes will need to be designed for static stability under various conditions (e.g., during construction and in the long term). In addition, potential settlement of

the subgrade under the berm footprint and within the containment system itself will need to be considered during the FS."

Comment #30:Section 1.9: Task Descriptions:
Replace fourth bullet, "Study Element 4: Engineering…" with: "Study Element 4: Engineering Construction Evaluation. Data will be used to support design of remedial actions, including removal of contaminated sediments and the potential construction of an on-site CDF or removal of contaminated sediments for offsite disposal."

Comment #31:Section 1.9.1: Study Element 1: Nature and Extent Evaluation:
Replace first sentence of first paragraph, "Additional data on the horizontal…" with: "Additional data on the horizontal and vertical distribution of COPCs needs to be collected to confirm existing Site data and to address the data gaps associated with evaluation of the nature and extent of contamination (Section 1.8)."

Comment #32:Section 1.9.4: Study Element 4: Engineering Construction Evaluation:
Replace first paragraph, "This study element requires…" with: "This study element requires geotechnical information, characterization of dredgability of sediments, and information on the physical properties of sediments adjacent to the impoundments to support design of a potential containment system, such as a CDF, within the area of the impoundments as a potential long term remedial action."

Comment #33:Section 1.10.2.2, Analytical Approach:
The analytical approach proposes to archive certain samples for later analysis. Please note that the decision to analyze the archived samples needs to be done quickly or the holding times for the analysis may be exceeded. In addition, the analytical approach states that the 95 percent upper confidence limit (UCL) will be used to calculate the exposure point concentration. EPA strongly recommends that ProUCL 4.0 be used to calculate the reasonable maximum exposure (RME) concentration for use in the risk assessments. ProUCL can be found here: http://www.epa.gov/esd/tsc/software.htm

Comment #34:Section 1.10.4: DQOs for Study Element 4: Engineering Construction Evaluation:
Replace first paragraph, "The RI/FS will address…" with: "The RI/FS will address the nature and extent of contamination and associated risks in the vicinity of the Site (Figure 5), and will result in plans for remedial actions. Additional information is needed to evaluate the feasibility of construction of a containment system, such as a CDF, within the area of the impoundments as a potential long term remedial action."

Comment #35:Section 1.10.4.1: Statement of the Problem:
Replace first paragraph, "The former impoundment containment…" with: "The former impoundment containment berms have been degraded through regional subsidence and erosional energy from the San Jacinto River. The impoundment containment needs to be re-established. By rebuilding the containment berms, there is a potential to create a replacement of sediments within the impoundment footprint that may have been resuspended and redistributed outside of the impoundment footprint and within the river channel. Geotechnical data are required to evaluate the feasibility of a CDF and containment design and construction elements as a potential

remedial design. Evaluations include dredgability of the river sediments, berm design, and CDF design. Geotechnical information required includes conventional parameters, sediment permeability, sediment strength, and sediment compressibility.

Comment #36:Section 1.10.4.1: Statement of the Problem:
Replace last sentence of second paragraph, "The data collection and…" with: "The data collection and evaluation will support feasibility, conceptual, and design studies for the impoundment area."

Comment #37:Section 1.10.5: Integration of Study Element Designs:
Delete section.

Comment #38:Section 2.2.1, Surface Sediment Samples for Chemical Analyses:
The surface sediment samples are proposed to be collected at two different depths (i.e., 4 inches for the nature and extent and ecological receptors exposure; 6 inches for human health exposure). However, one sediment depth of 6 inches should be collected for the nature and extent, ecological receptors exposure, and human health exposure. This is because the collection devices (e.g., petite-Ponar) are not precise enough to differentiate between 4 and 6 inch depths. Also, if only one sample depth is collected, the sample size potentially could be increased.

Comment #39:Appendix A, Draft Sediment Field Sampling Plan, Section 1, Introduction:
Replace the third paragraph "The primary objectives of…" with: "The primary objectives of the 2010 sediment study are to collect information on chemical concentrations and geotechnical properties of the sediment at the Site and to collect information for the nature and extent, exposure, and fate and transport analyses of the sediment from the impoundments. Chemicals of potential concern (COPCs) data will also be collected from upstream background areas near the Site. As discussed in the QAPP, sediment data will be used to support Site characterization, and risk assessments (i.e., human health and ecological) that will be conducted as part of the RI/FS."

Comment #40:Supplemental engineering design considerations for Study Element 4:
The anticipated number of samples to be taken is not explicitly justified per pertinent ASTM standards, and may be judged to be too few, given the dimensions and importance of the project. Specifically, only six locations and three depths are currently anticipated for VST (per Section 2.2.4, Vane Shear Testing). This seems inconsistent with the other planned tests (e.g., triaxial testing, per Table 12). Given that a major cost of Study Element 4's activity is mobilization of the equipment, a large enough statistical database must be generated from the less expensive VST tests, so that any data gaps in the more expensive testing (e.g., triaxial testing) may be reliably filled in. Also, additional depths from the current 3 ft maximum depth (per Table 15) to at least 20 ft maximum depth should be subjected to VST, so as to establish connections with other field testing, including the Standard Penetration Test (per Table 12).

Comment #41:Supplemental engineering design considerations for Study Element 4:
A potential containment system model and corresponding input parameters should be described, such as a model like Long Term Fate of Dredged Material (a.k.a. LTFATE). Also, as an example of a missing parameter, no mention of measuring current groundwater discharge/recharge and seasonal fluctuations are provided.

Comment #42:Supplemental engineering design considerations for Study Element 4:
Are future erosion evaluation techniques, such as Sediment Erosion at Depth Flume (a.k.a. SEDFLUME) planned for any potential containment system?

Comment #43:Supplemental engineering design considerations for Study Element 4:
Geotubes are planned to be part of a potential remedy evaluation and Geotube operations include pumping, polymer addition, and allowance of time to dewater. However, no polymer screening methodology is mentioned and no "hanging bag" tests were proposed for the Geotube evaluation.

Comment #44:Supplemental engineering design considerations for Study Element 4:
Are there any geotechnical test specifically designed to evaluate the stability of potential barrier materials (e.g., ACBM) placed on the shoreline? This material can subside in fine grained material.

Comment #45:Supplemental engineering design considerations for Study Element 4:
A containment system might be enhanced in performance if geotextiles and/or oganophilic clays are incorporated as part of the potential containment system design. If organoclays are considered, both sorption isotherms and compression tests under load should be evaluated.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 9, 2010

Mr. Stephen Tzhone, Remedial Project Manager
U.S. EPA, Region 6
Superfund Division (6SF-RA)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: *Draft Sampling and Analysis Plan: Sediment Study (SAP)*, dated February 2010 - Comments
San Jacinto River Waste Pits Federal Superfund Site
Harris County, Texas

Dear Mr. Tzhone:

The Texas Commission on Environmental Quality (TCEQ) Remediation and Toxicology Divisions have completed review of the *Draft Sampling and Analysis Plan: Sediment Study (SAP)*, dated February 2010. The draft SAP was prepared by Integral Consulting Inc. and Anchor QEA, LLC. TCEQ comments are provided below under section numbers and titles which correspond to those contained in the Draft SAP.

General Comments

1. This is a multi-faceted workplan containing a diversity of elements expected to be addressed in greater detail in subsequent submittals; however, the document seems to propose significant decisions with minimal discussion or justification. These review comments begin to address these issues when they first arise in order to avoid future miscommunications or delays.

2. It is important for the Remedial Investigation (RI) process to fully consider existing information generated about the Study Area and surrounding areas regarding dioxin contamination, including that data generated as part of the TCEQ Total Maximum Daily Load (TMDL) (e.g., project documents - http://www.tceq.state.tx.us/implementation/water/tmdl). These studies indicate widespread exceedances of Texas water quality standards for the water column

and select tissue, sediment levels protective of fish ingestion and that sediment is the primary source of dioxin to the water column and tissue. Furthermore, initial source characterization data of atmospheric deposition, stormwater discharges and point source discharges indicate these sources provide minor explanations of the current dioxin concentrations in multiple media.

3. The dissolved water column concentrations of dioxin indicate partitioning to sediment may not be as dominant as expected, potentially indicating a dynamic exchange between pulp mill waste, affected sediment, sediment pore water and the water column – particularly in areas of high dioxin concentrations and low total organic carbon levels. This is supported by preliminary findings of fugacity ratio analyses indicating that the normal sorption gradient is reversed for some of the most toxic congeners, such that they can desorb from sediment to the dissolved phase (University of Houston et al., 2005). It is important for the RI/FS process (including Study Element 3: Physical Conceptual Site Model (CSM) and Fate and Transport Evaluation) to consider existing information when determining the media and processes that warrant further examination so that the CSM appropriately identifies and integrates the issues and processes at play within the Study Area.

Specific Comments

4. **Section 1.4.2.1 Existing Sediment Data, Page 9**: Text indicates that the preliminary site perimeter was identified in the 2009 Unilateral Agreed Order. TCEQ suggests that the text provide more discussion regarding the basis for this decision and any defined decision mechanism to change this as it is noted as "preliminary."

5. **Section 1.4.2.1 Existing Sediment Data, Page 9**: To define the downstream limit of the Study Area (i.e., at the confluence with Houston Ship Channel at the San Jacinto Monument) based on the current limited understanding of processes at play within the Preliminary Site Boundary is premature. It is understood that additional evaluation will be performed as part of the RI/FS process, so it seems appropriate to reserve such a determination, except as preliminary, until adequate information is generated and/or justification is provided.

6. **Section 1.4.2.1 Existing Sediment Data, Page 10**: The second paragraph: "The confluence of the Houston Ship Channel with upper Galveston Bay at the San Jacinto Monument, approximately five miles downstream of the impoundments, is therefore considered to be the downstream limit of the local sediment data relevant to interpretation of data from the Site (Figure 5)" is not correct.

   The channel joins Galveston Bay at Morgans Point, which is at least another eight miles from the San Jacinto Monument and Lynchburg Ferry, and at least 10 miles from the SJWP site. The Area of Concern (AOC) boundary indicated in Figure 5

is at the confluence of Buffalo Bayou with the San Jacinto River, which (from scale on map) is a little over 2 miles from the SJWP. The ship channel itself is in the San Jacinto River from Morgans Point up to Lynchburg, then follows Buffalo Bayou towards the west.

There are data from 2008 and 2009 that indicate polychlorinated biphenyls (PCBs) in sediment analyses from at least four sites within the AOC now available from a TMDL project. There were also 2002 PCB data from several sites in the San Jacinto River. All those data quantify all PCB congeners, not just Arochlors. The 2008 and 2009 data sets have been FTP'd to AnchorQEA. This document does not seem to recognize the existence of the TMDL PCB data.
The 2009 sediment grab sample at station 11193 (near the I-10 bridge) showed a very high PCB concentration.

7. **1.4.3 Problem Definition and Overall CSM, Page 12**: Text indicates that the overall issue to be addressed by the RI/FS, and by sediment sampling in particular, is to determine the horizontal and vertical distribution of pulp mill compounds associated with sediment originating in the impoundments. The CSM provided in Figure 7 does consider sediment releases to surface water and vice versa, but text does not acknowledge the need for the RI to evaluate the potential releases from sediment as pore water mixing into the water column and subsequent partitioning to upstream or downstream sediments or biological uptake from the water column.

8. **Section 1.5.2 Characteristics of Sediments in the Impoundments, page 17**: Text indicates the potential for use of patterns of dioxins and furans typical of the impoundments to provide a tracer or signal for impacts of pit material on area sediments. This approach is expected, but should also consider the potential for differential desorption of congeners to water and/or tissue potentially resulting in altered congener patterns, upon subsequent partitioning to sediment.

9. **Section 1.6.1 Background Concentrations Used in the Risk-Based Screens, Page 20**: Numerous COPCs were screened out based on comparison to background concentrations, when present at concentrations greater than risk-based benchmarks. While this is not atypical, the background data sets used are not appropriate. As discussed in our meeting of January 20, 2010, the SSI data were not intended to support an RI as they were collected prior to our current understanding of the pits, and the TCEQ 85th percentile values are biased high because they are based on routine monitoring events conducted by TCEQ and its contractors, which typically target impacted water bodies. The TCEQ 85th percentile values in particular should not be used as background. Time constraints have not allowed evaluation of the USGS data. It may be prudent to remove the screen based on background, pending collection of appropriate data. Furthermore, our understanding is that EPA guidance does not allow COPC screening based on comparison to background except later in the risk assessment

process. While we support a focus on potential risk drivers, the approach taken is questionable.

10. **Section 1.6.2-Human Health Risk-Based Screen, Page 21**:
COPC screening procedures appeared to be inconsistent with TCEQ Texas TRRP Rule, 30 TAC §350. TRRP has applicable TotSedComb PCLs available. When compared to the USEPA Region 3 Soil PRGs used for Human Health COPC screening, there were some COPCs which had a more conservative TotSedComb PCL available. However, when looking at the screening criteria, it appears the COPCs with the lower TotSedComb PCLs would still screen out.
It is unclear if total PCBs were screened out using congener specific data or arochlor data. Due to the potential for weathering to cause arochlors not to be detected when PCBs may in fact be present, the congener specific analysis should be considered prior to being screened out on arochlor analysis.

    It is unclear if dioxin-like PCBs were considered in the dioxin TEQ, or which TEFs were used. The EPA September 2009 draft *Recommended Toxicity Equivalency Factors (TEFs) for Human Health Risk Assessments of Dioxin and Dioxin-Like Compounds* recommends the use of the consensus TEF values for 2,3,7,8-tetrachlorodibenzo-p-dioxin and dioxin-like compounds, including polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and PCBs, published in 2005 by the World Health Organization (WHO). TRRP Figure: 30 TAC §350.76(d)(2)(B) indicates the TEFs to be used for dioxin-like compounds, which also includes dioxin-like PCBs. Although TRRP has not yet been revised to include the 2005 WHO TEFs, it is recommended that those TEFs be considered when calculating a TEQ, especially if they result in a higher TEQ.

    Sediment concentrations to be protective of consumption of edible fish and shellfish do not appear to be included in this document. However, this pathway is an important one that the TCEQ would like evaluated. Evaluation with temporal and spatially related tissue and sediment data for this site should be considered.

11. **Section 1.6.3 Benthic Macroinvertebrate Risk-Based Screen, Page 21**: Since dioxin will be a part of the SAP analytical program regardless of the benthic screen and a detailed discussion of their toxicity to these organisms has not been provided, this issue and decision should be explored in detail within the SLERA. Be aware of interest in a range of invertebrate species within the Study Area, to include crab, shrimp and bivalves, as well as more traditional members (e.g., oligochaetes and amphipods) of the community. We note that the Barber et al. 1988 results are based on an acute toxicity test to a single species. A detailed literature review that supports a conservative screening value should be provided.

12. **Section 1.6.4 Fish and Wildlife Risk-Based Screen, Page 23**: The proposed screening process excludes PCBs as COPC for fish/wildlife based on site data being less than TCEQ tidal stream 85th percentile data. We note that EPA, 2008, which appears to be the most recent and relevant guidance on the TEF approach

in ecological risk assessment, recommends that PCB congeners with dioxin-like toxicity mechanisms be included in determining total dose to fish and wildlife. Again, TCEQ 85th percentiles should not be considered background concentrations.

13. **Section 1.7.2 How the Sediment Study Addresses COPCs, Page 25**:
It is stated that "If the secondary COPC does correlate with dioxins and furans, it will not be evaluated in the [BLRAs]." Whether or not a secondary COPC will not be evaluated in the BLRAs will depend on the relative concentrations between the secondary COPC and dioxins and furans for each sample. TCEQ will need to see the data to be sure the screening is appropriate.
Section 1.8.2.1 Human Exposure, Page 28:
Fishers, recreational visitors, and transient people are listed as the three human receptor groups. Although the trespasser will probably be similar, to be consistent with other pathway evaluations, the trespasser receptor should be included.

14. **Section 1.8.4 Fate and Transport-Related Information, Page 30**: The interactions between pulp mill wastes, affected sediment, sediment pore water and the water column in regards to transport and exposure to ecological receptors should be a component of the RI.

15. **Section 1.9.1 Study Element 1 – Nature and Extent Evaluation, Page 33**: Text states that the definition of a remedial action boundary is expected to be made primarily on the basis of PRG exceedances in surface sediment as it is the primary exposure source. This does not adequately consider the dynamic nature of area sediments due to storm events, the shallow nature of the water column and shipping disturbances.

16. **Section 1.10.1.2 DQOs for Study Element 1 – Analytical Approach, Page 38**: Regarding characterization of background concentrations, current TCEQ policy on prediction limits is use of the 95% Upper Prediction Limit.

17. **Section 1.10.1.3 Sample Collection Design, Page 39**: Text indicates coring will not be conducted within the impoundment because the area is expected to be reconstructed as a Confined Disposal Facility for dredged material and the impoundment itself will not be dredged. Given that an adequate alternatives analysis is expected for the disposition of the pits, it is unclear how the proposed sampling scheme within the pits is capable of determining current waste volume in order to evaluate potential off-site treatment and/or disposal options. Core samples should be collected from the impoundment areas.

18. **Section 1.10.1.3.1 On-site Chemical Distribution Samples, Page 39**: The discussion indicates that cores for nature and extent characterization will be collected at a subset of 10 of the high intensity sampling locations, focusing on locations closest to the impoundment (Figure 15). TCEQ suggests that the

potential for prop scouring and navigational dredging, as mechanisms that can expose deeper sediments, should be factored into the location and number of sample locations designated for core sample collections, since preliminary results indicate high concentrations occur at depth.

19. **Section 1.10.1.3.2 Background Samples, page 40**: Regarding the general locations of proposed background samples, text states that locations are below the channelized portion because conditions are more similar to those at the pits. Location of background samples is an important design element as background risk will be developed to gauge what risk would be present in the absence of the pits.

    Detailed justification is needed that considers existing analytical data for the proposed area, congener proportions, the presence of historical spills; as well as analysis of transport issues, including tidal movement and transport as suspended solids, water column and biological movement. Discussion should include the rationale for the location and number of background sample locations considering the nature of the activities surrounding the sample location(s) and any nearby potential sources of contamination (e.g., railroad right-of-way). Background sample locations should not be established at locations directly influenced by or in close proximity to obvious sources.
    Furthermore, should the proposed area be determined appropriate for bulk sediment background determinations, the potential for future collection of mobile tissue from this area is likely to have considerable technical issues.

20. **Section 1.10.2 DQOs for Study Element 2: Exposure Evaluation, Page 41**: Text states "the RI/FS will address risks to human and ecological receptors associated with contamination of San Jacinto River sediments at the Site." Granted, this is a bulk sediment sampling plan, but it is laying the foundation for several future submittals. Note that water is a significant media of concern within the Study Area, as it is a bioavailable media previously shown to be affected per TCEQ TMDL project documents.

21. **Section 1.10.2.2 Analytical Approach (Characterization of exposures to ecological receptors on the Site), Page 42**: The discussion indicates that the exposure profile will consist of a measure of the central tendency concentration, and the statistics to be used for these (e.g., the mean vs. the median for the central tendency) will be determined after the chemistry data have been evaluated to identify the most appropriate representation for these areas. TCEQ guidance suggests that the 95% Upper Confidence Limit be used as the exposure point concentration for most wildlife receptors.

22. **Section 1.10.2.2 Analytical Approach (Characterization of exposures to ecological receptors on the Site), Page 42**: Text indicates that concentrations of COPCs in intertidal sediments from the shoreline areas listed will be used to

characterize the exposure profiles in each area for each bird and mammal receptor, and for near shore-dwelling fishes. This may be appropriate for incidental ingestion of sediment but does not address the prey to wildlife and fish only pathways.

23. **Section 1.10.2.2 Analytical Approach (Characterization of exposures to ecological receptors on the Site), Page 43**: : It is unclear why only nine intertidal sediment samples designated for ecological exposure characterization are proposed, particularly in relation to the number of locations proposed for human health exposure characterization. It is also unclear that the proposed sample locations are adequate to allow interpolation of data (i.e., kriging) throughout the Site. Also, please clarify the intent on development of an exposure point concentration for these data.

24. **Section 1.10.2.2 Analytical Approach, Page 42:** The "mitigation area" associated with the dredging permit and the northwestern property also looks like a place where people may access the shoreline by foot. It is TCEQ's understanding that the mitigation area was built up using sediment produced by the sand dredging operation, so it may be contaminated, but the mitigation area is closer to I-10. Historic aerial photos show the mitigation area to have been built up during 1998-2005, in the same period when the sand dredging work was active. Figure 17 indicate the mitigation area would be sampled for "ERA Surface Sediment (Primary COPCs)", but much less intensively than the three human use sites listed above. Perhaps the mitigation area needs more sampling or consideration for human use and exposure.
25. **Section 1.10.2.3 Sample Collection Design, Page 45**: The focus on surface sediment sampling (i.e., 0-4 inches) may not be appropriate for this particular site if it is too shallow to represent the biologically active zone. We note the relatively sandy substrate and that invertebrate burrows, potentially deeper than four inches have been observed at the pits. The biologically active zone can probably be represented by the upper six inches, which will allow select intertidal locations to be used to characterize exposure to both human and ecological receptors.
26. Furthermore, the basis for proposing a single depth for each intertidal sample for ecological characterization is unclear. The potential for disturbances to surface sediment (i.e., storm events, shipping, biological) and potential risk management indicate a similar need for samples at depth as those proposed for the human health exposure characterization.

27. **Section 2.4.1, Physical Properties and Geotechnical Analyses, Page 61, in the third paragraph:** statements are made that total organic carbon (TOC) in sediment will be analyzed using a modified version of EPA Method 9060A but quadruplicate TOC analyses (as specified in the method) will not be required for this project.

However, since there is a high degree of variability associated with the determinative technique utilized in EPA Method 9060A (i.e. the instrument is simply counting carbons via either an infrared or flame ionization detector following catalytic combustion in an induction furnace) and the method is being modified for sediment matrices which will likely be somewhat heterogeneous in composition, quadruplicate TOC analyses are warranted as specified in Section 7.6 of the method. Additionally, Section 8.4 of the method requires one spiked duplicate sample be analyzed for every ten project samples, not simply the analysis of one laboratory duplicate per 20 samples as stated in the SAP. Lastly, if the dioxins/furans results are to be normalized based on TOC as a measure of bioavailability, the end data use of the TOC data is critical and justification is warranted for the above significant deviations from the analytical method.

Section 4.1, Criteria for Data Review, Verification, and validation, Page 75: TCEQ recommends that if the project QC acceptance criterion has been established for the evaluation of field split sample results and the RPD results will be tabulated, then at a minimum, detected results associated with the field split sample pairs should be qualified as estimated in instances where the project QC acceptance criterion is exceeded.

28. **Exhibit 52 Method Selection Worksheet**: Please provide the source and endpoint for the "concentration of concern or PRG" provided for 2,3,7,8-TCDD ng/kg TEQ 3.11 ng/kg.

Additional Comments on the Figures Presented:

Figure 3. Land Use Map is hard to interpret, but it seems to place coastal wetlands into a category called "Farm Ranch Lands" or another category. The existence and location of wetlands and other ecological habitats in the vicinity of the site should be acknowledged.

Figure 14. The figure incorrectly labels wetlands within the impoundment as "uplands".

Figure 15. Several suggestions to improve the quality and usability of the data generated:

a) Need surface COPC samples in both pits to characterize the source materials. Although a few samples have been collected in the impoundments, they have been sporadic in location and did not adequately characterize secondary COPCs. Should also ensure that the samples from within the impoundments are not located on old levees.
b) Need core samples from both impoundment areas to determine the nature and extent of the materials in the pits. These core samples should also characterize the levels of contamination in native sediment layers under the waste material. This information is needed to evaluate other alternatives to the construction of a CDF and to evaluate the likelihood of contaminant migration into groundwater or sediment layers below the pits.

c) The sample at SJNE032 should be a core sample. The depth of contamination in this delta feature will likely differ from that in the other "ambient" cores.
d) The grid pattern places the samples SJNE018, SJNE013, SJNE002, and SJNE007 near or on land in the area of the barge activities downstream of the I-10 bridge. These samples should be moved into deeper water where appropriate in order to better characterize distribution of site contaminants.

Figure 16. The ecological samples SJRH050, SJRH051, and SJRH052 are too close to the railroad bridge. (See TCEQ comment 19.) These samples should be further upstream near the SJSH031 sample area.

Figure 17. Human health samples on the east side of the river should extend further south onto more natural shoreline and not be located just in the armored shoreline near the bridge. On the west side of the bridge, the more natural shoreline is north of the bridge and the samples should reflect this.

Citations

Texas A&M University, Galveston, 2009. Fate of Dioxin in the Houston Ship Channel and Evaluation of Natural Remediation Processes. October 2009.

University of Houston/Parsons Water & Infrastructure/PBS&J. 2005. Total Maximum Daily Loads for Dioxins in the Houston Ship Channel (Draft Final Report). September, 2005.

EPA, 2008. Framework for Application of the Toxicity Equivalence Methodology for Polychlorinated Dioxins, Furans, and Biphenyls in Ecological Risk Assessment. EPA100/R-08 /004. June 2008.

If you have any questions please, contact me at (512) 239-6368 or John Wilder at (512) - 239-2579.

Sincerely,

Ludmila Voskov, P.G., Project Manager
Superfund Section
Remediation Division
Texas Commission on Environmental Quality

LV/lv

Cc: Tracie Phillips, Toxicology Division, TCEQ
John Wilder, Remediation Division, TCEQ

To: Stephen Tzhone, EPA RPM
From: Jessica White, NOAA Jessica White
Date: 3/8/2010
Re: State and Federal Natural Resource Trustee Comments on Draft Sampling and Analysis Plan: Sediment Study, San Jacinto River Waste Pits Superfund Site

1. Page 16, last paragraph, 2nd Sentence. This sentence indicates that data on liquid effluents from pulp mills derived from Suntio et al (1988) was not used in the COI screening process because liquid effluents and liquid wastes were removed from impoundments at the site. Previous presentations by Anchor QEA indicated that solid and liquid pulp mill wastes were likely to have been placed in the western impoundment and decanted into the eastern impoundment. The discussion on Page 7, second paragraph describes a drain line which allowed flow of excess water from the west impoundment to the east impoundment. These descriptions suggest that:

a. Liquid effluent may have been retained in the west impoundment if liquid levels were below the drain line. Depending on the characteristics of the COI, retained liquid may have led to sedimentation or similar processes which caused the COI to be permanently retained in the west impoundment,

b. Liquid effluent may have also been retained in the east impoundment, and

c. Liquid effluent may have entered the river when liquid levels exceeded impoundment levees due to precipitation, subsidence, or erosion.

Recommend that the chemicals in Suntio et al (1988) be added to the COI screening process.

2. Page 20, Section 1.61. Neither the NURE or the Texas Water Quality databases are likely to contain any significant sediment data on pulp and paper mill wastes that will be useful as background (See Table 10). It is not clear that the procedure described in the SAP will be appropriate given the lack of a robust data set.
Some consideration needs to be given to collecting background sediment samples in nearby streams that are not potentially impacted by the site.

3. Page 42, Section 1.10.2. The proposed maximum depth of 6 – 12" for the samples labeled SJSH 11-20 may be insufficient for characterizing either human or ecological risk. This property has been constantly reworked – receiving sand from dredging and removing sand by barge and truck - for delivery to other areas. As such the depth of contaminated sediments may be greater than 12".

Coring should be performed to identify the original soil profile and samples should be taken to that depth.